ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Biochemical Sciences

Candidate: Bc. Jesika Štorkánová

Supervisor: RNDr. Eva Novotná, Ph.D.

Title of diploma thesis: Study of the cytotoxicity of selected chemotherapeutics for the treatment of leukemia in human tumor cell lines

Leukemia represents a diverse group of malignant diseases with a hematopoietic disorder with different prognoses. As the incidence of patients with leukemia is increasing, is an effort to establish the treatment that will lead to successful therapy. One of the basic approaches to the treatment of leukemias is chemotherapy. Today it is known that the effectiveness of chemotherapy is influenced by a number of factors which can significantly affect the treatment strategy and thus decide on the outcome of the treatment itself. An important approach in chemotherapy is the selection of cytostatics with maximum efficacy for oncological disease and elimination cytostatics to which the cells are resistant based on the findings in *in vitro* conditions.

The aim of this diploma thesis was to determine the inhibitory effects of *in vitro* selected chemotherapeutics in cell tumor lines. For determine the inhibitory effect, HCT116, HepG2 and HL-60 cell lines were selected using a colorimetric method based on the determination of amount metabolically active cells (MTT and XTT assay). The subjects of the study were antimetabolites (cladribine, cytarabine), alkylation cytostatics (cyclophosphamide), anthracyclines (daunorubicin), prednisolone and all-*trans*-retinoic acid.

Based on *in vitro* results, we could determine the lowest possible concentration of selected cytostatics with sufficient inhibitory activity. From these findings, we further concluded that inhibitory effects of cytotoxic agents would be appropriate in combination studies. The combination of cytostatics may favorably affect the therapeutic effect at lower concentrations than cytotoxic drugs themselves, and so we may reduce side effects.